THE WILLIAM L. BRYANT FOUNDATION

American Studies Report Number One

ARCHAEOLOGICAL INVESTIGATIONS OF THE CASTLE WINDY MIDDEN FLORIDA

by

Ripley P. Bullen

and

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PREFACE

This is the first in a contemplated series of studies, based on archaeological investigations, on the pre-Columbian cultures of Florida and the West Indies to be published by the William L. Bryant Foundation of Springfield, Vermont.

The Bryant Foundation since its inception in 1950 has been interested primarily in creating Spanish-American collaboration in the field of Spanish Classical Archaeology. The initial project was the excavation of a Roman amphitheater at Tarragona, Spain. Other excavations were made at sites in the environs of Tarragona and Valencia and on the island of Mallorca where an early seventeenth century manorhouse was bought and restored as an archaeological center. There a small museum and library were installed together with living quarters for scholars and students. Besides the publishing of studies based on these excavations the Foundation is also publishing a series of definitive works on Spanish ceramics to serve as tools for future field work.

It was not too great a step to extend this interest to those parts of the New World discovered by Spain and upon which she left enduring cultural impressions. I happened to own the site of Castle Windy, the kitchen midden which is the basis for this study, and in 1955 I approached Ripley P. Bullen, Curator of Social Sciences at the Florida State Museum at Gainesville, Florida, and Frederick W. Sleight, Director of the Central Florida Museum of Orlando, Florida, about a collaborative investigation. We came to an agreement but delays arose which prevented the initiation of the work until November 1956. The field work was completed the following summer but the dating of several carbon samples created further delay and thus it was not until the summer of 1958 that the work was ready for publication.

In this report, Bullen is chiefly responsible for the description of excavations, typology of specimens, and chronological discussion. Sleight, on the other hand, is chiefly responsible for the discussion of food remains and their implications. Both cooperated in all aspects of the field work. Photographs at the site are by Sleight while those of specimens were made at the Florida State Museum and by Sleight. Artifacts discovered while making this excavation remain the property of the Bryant Foundation and are housed with the Central Florida Museum. Sherd collections remain on file at the Florida State Museum.

The collaboration between the three groups has been a satisfying and productive experience and has led to a program of additional projects which we trust may be acceptable contributions to the work already done in this field.

William J. Bryant

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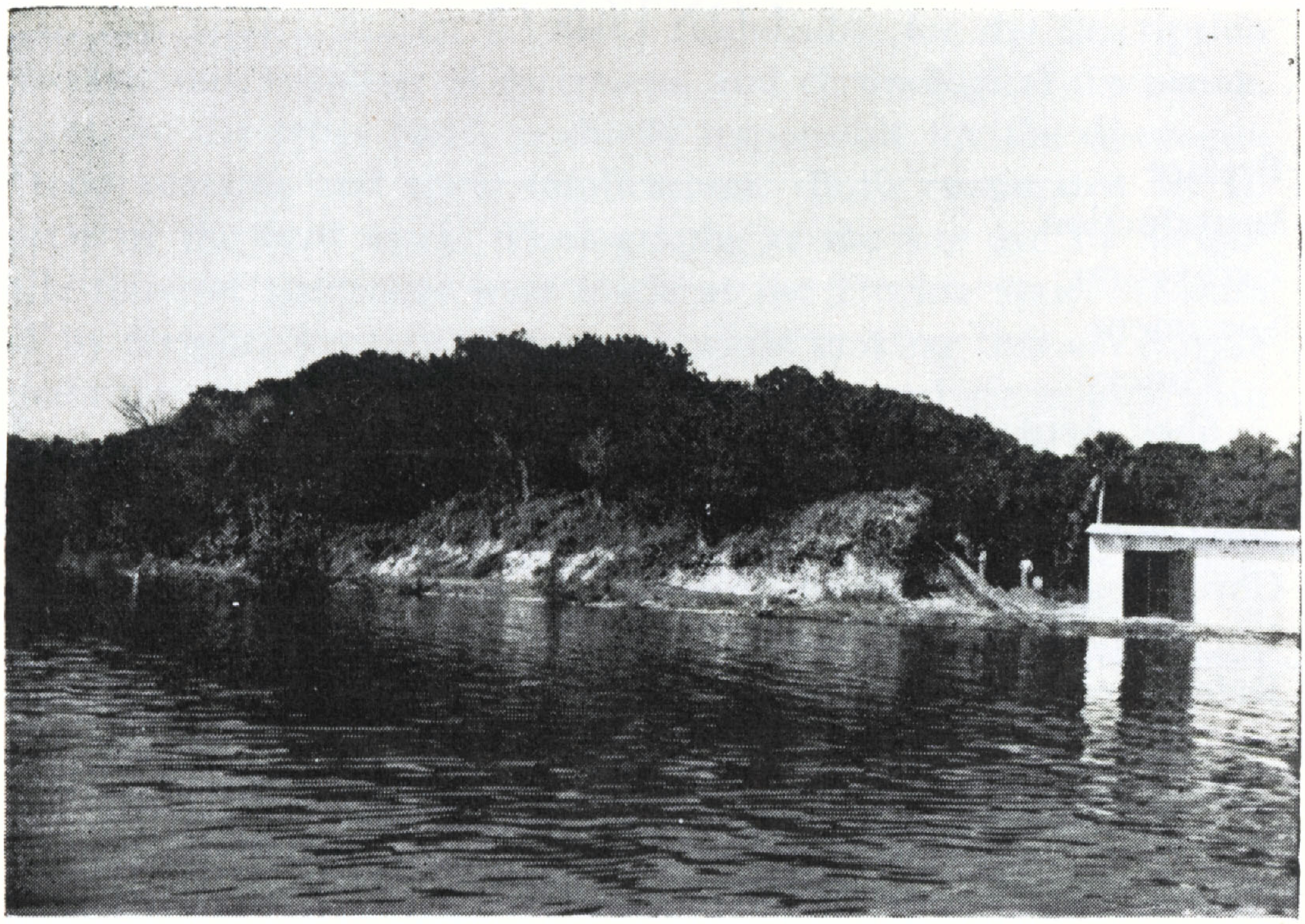

Plate I. The Castle Windy Site (looking east from Mosquito Lagoon)

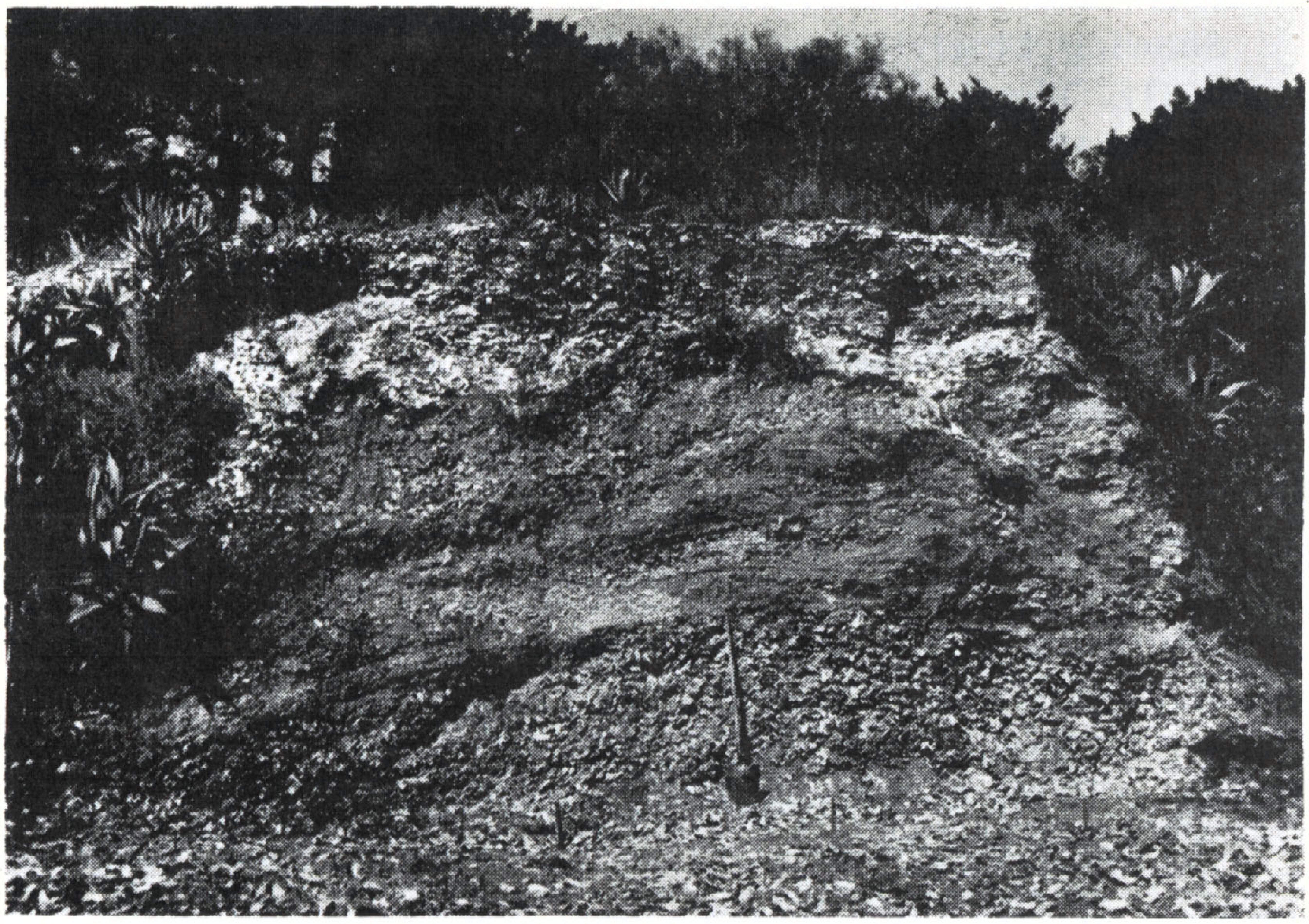

Plate II. The Cleaned Midden Face Prior to Excavation Showing Three Major Superimposed Zones

INTRODUCTION

The Castle Windy site is located about 12 miles southeast of New Smyrna Beach, Florida, on the western side of the low and narrow island which separates Mosquito Lagoon from the Atlantic Ocean (fig. 1,*1*). The site consists of a shell ridge or midden which parallels the lagoon for 295 feet. In one place this midden towers about 17 feet above the lagoon and extends landward to the east 120 feet (pl. 1).

Sometime ago a house was built on this high eminence. More recently it was demolished and a considerable amount of shell was removed. Now a steep face of the shell midden borders a level area which is only about 1.5 feet above the water of Mosquito Lagoon. On this level is situated a small frame structure belonging to William J. Bryant, owner of the Castle Windy property.

The Castle Windy midden has undoubtedly been known for many years, for several early accounts identify both the midden and the immediate surroundings. In 1823 Charles Vignoles, Civil Engineer, published an account (Vignoles, 1823, p. 40) which identified the region by the name Cigeras. Apparently the midden and surrounding hammock continued to be known by this name through the early part of the Nineteenth Century although a new name, Mount Rodney, was in usage by 1837 (Williams, 1837, p. 53).

The Castle Windy site is mentioned by Amos W. Butler in a paper presented by him at the Nineteenth International Congress of Americanists as follows: "No. 22. Castle Windy. High shell-mound; covers no great area; on peninsula, about two miles south of Turtle Mound" (Butler, 1917, p. 106).

The site is listed by Goggin in his survey of the archaeology of the northern St. Johns River as site VO 112 (Goggin, 1952, p. 95 and map inside back cover). It falls in sub-area III of Goggin's

Northern St. Johns Area (Goggin, 1952, fig. 1, p. 16) but is only a very short distance north of the division between that area and the more southerly Indian River Area (Rouse, 1951, fig. 1, p. 6).

According to Mexia's map of 1605, Castle Windy is located in what was Surruque territory at that time (Rouse, 1951, fig. 15, p. 266). Immediately to the south was Ais territory. This area was traversed by Dickinson and his party in 1696 on their trip to St. Augustine from a shipwreck farther south (Andrews and Andrews, 1946). However, radiocarbon dates, to be presented later, indicate Castle Windy was abandoned by Indians prior to the coming of Columbus.

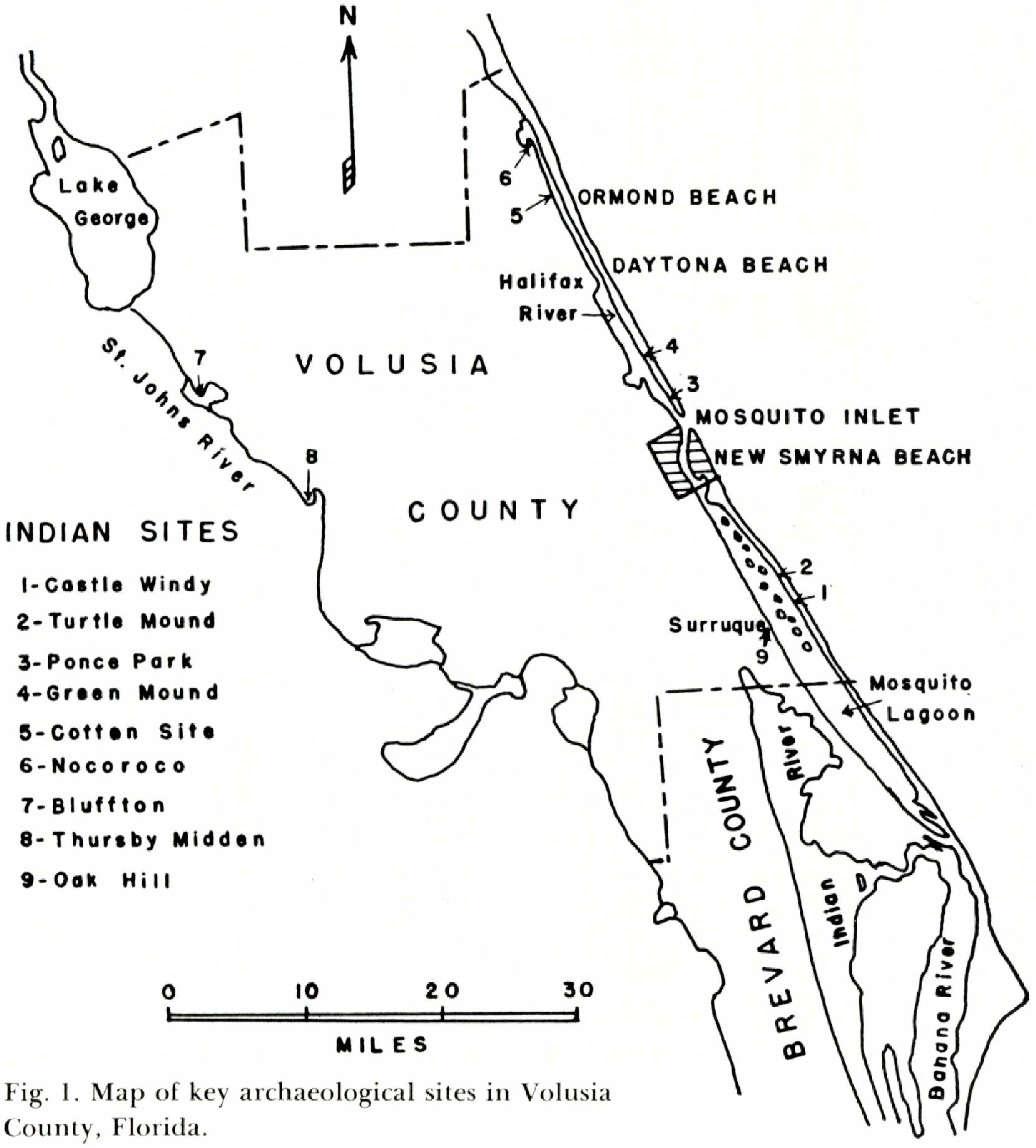
N
Lake George
St. Johns River
VOLUSIA
COUNTY
ORMOND BEACH
DAYTONA BEACH
Halifax River
MOSQUITO INLET
NEW SMYRNA BEACH
Surruque
Mosquito Lagoon
BREVARD COUNTY
Indian River
Banana River
1
2
3
4
5
6
7
8
9
INDIAN SITES
1-Castle Windy
2-Turtle Mound
3-Ponce Park
4-Green Mound
5-Cotten Site
6-Nocoroco
7-Bluffton
8-Thursby Midden
9-Oak Hill
0
10
20
30
MILES

Fig. 1. Map of key archaeological sites in Volusia County, Florida.

EXCAVATION

Our work at the Castle Windy site consisted of a stratigraphic test designed to shed light on the ceramic history of the area, to obtain a controlled sample of the shell composition of the site, and to secure samples for radiocarbon dates. Field work was divided between two trips: November 6 through 11, 1956, and May 23 through 26, 1957.

After installing a base line, we cleaned the face and recorded the profile left after previous shell removal. This profile revealed 3 major superimposed zones: a lower zone of loose and relatively clean oyster shells; a middle zone of compact, crushed coquina shells; and an upper zone consisting, toward the lagoon, of predominantly oyster shells and, between Stakes A2 and A4, of dirt plus clam and oyster shell (fig. 2; pl. II).

To determine if any cultural changes could be correlated with these major stratigraphic zones, our trench was dug opposite Stakes 5 and 6 (fig. 2). Excavation was made by arbitrary 1-foot levels which formed the vertical analysis units used later.

Due to a little optimism on our part, in view of the length of time available for this work, the southwestern edge of our trench was started 5 feet too near the lagoon. To save time, the area of the test was reduced by about half at a depth of 4 feet. Similarly, at a depth of 7 feet, it was again reduced.

However, the area after this last reduction was not as small as suggested on the excavation plan because the face of the profile sloped outward with depth (pl. III). Hence, the distance from Stake A3 to the face of the profile was considerably more at a depth of 7 feet than is indicated in the plan for the surface of the midden. Excavated areas and depths are indicated on the plan and profile (fig. 2) and excavated areas indicated on charts and tables. In Figure 2, the distance from the base line to the face of the midden is not to scale. Actually, this distance was greater than it would appear from the plan view.

Data from the bottom of our trench, from a test beside Stake 6, and from another made beside Stake 8, showed the midden at these points to rest upon beach sand. Sherds of St. Johns Check Stamped pottery, found between the base of the midden and this beach sand,

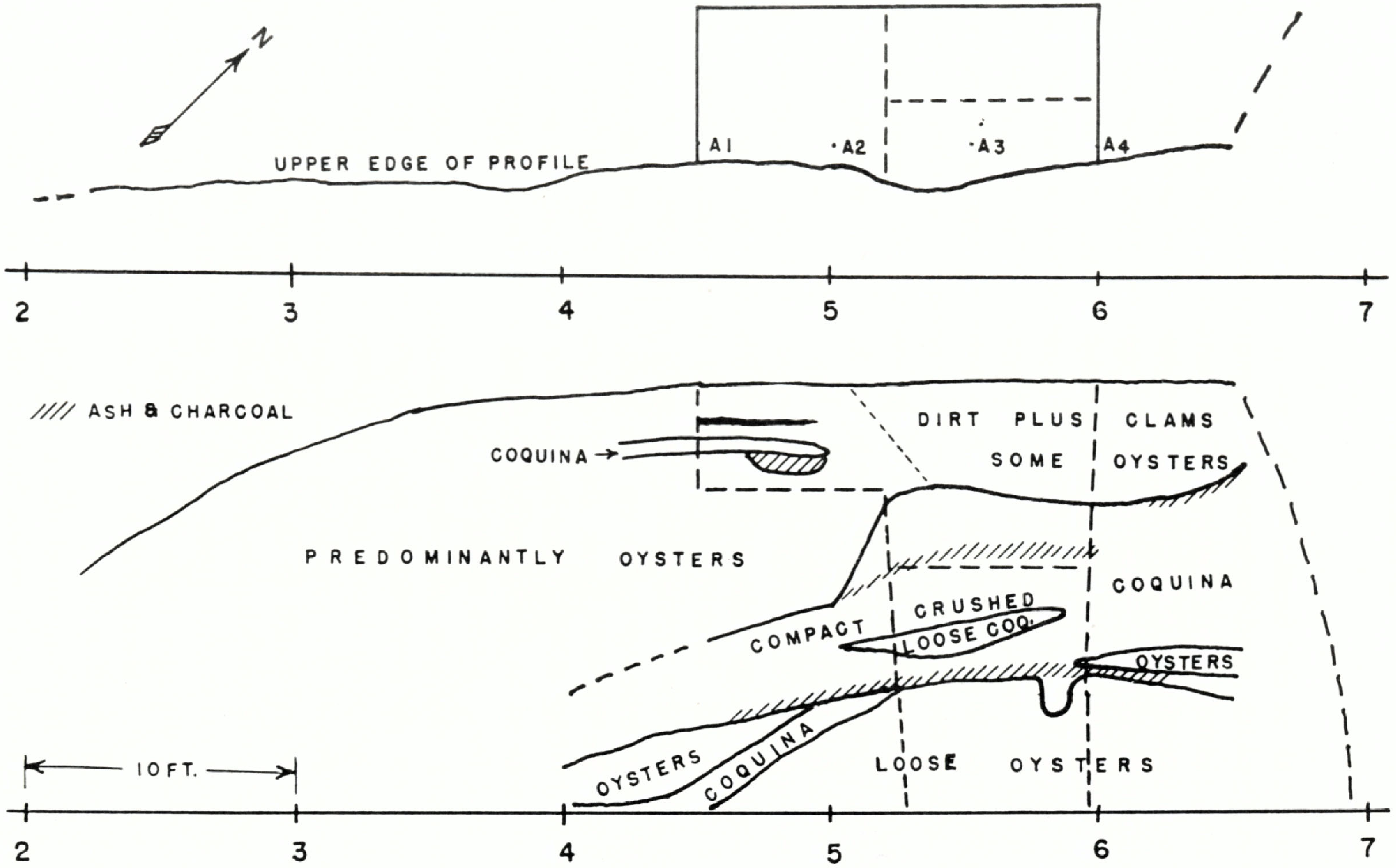
N
UPPER EDGE OF PROFILE
A1
A2
A3
A4
2
3
4
5
6
7
//// ASH & CHARCOAL
COQUINA
DIRT PLUS SOME
CLAMS OYSTERS
PREDOMINANTLY OYSTERS
COQUINA
CRUSHED
LOOSE COQ.
COMPACT
OYSTERS
OYSTERS
COQUINA
LOOSE OYSTERS
10 FT.

Fig. 2. Plan and profile of stratigraphic excavation at the Castle Windy site.

demonstrate all of the midden at this location to have accumulated after the start of the manufacture of such check-stamped vessels. Hence, the Castle Windy site may be assigned to the St. Johns II period of the region. The equivalent period in the Indian River area, immediately to the south, would be Malabar II.

Information from these tests and an examination of the profile (fig. 2) indicate the manner of growth of the midden in the area of our work. Indians, living near our Stakes 5 and 6, disturbed the upper 9 inches of beach sand and, inadvertently, mixed with this sand the shells remaining from their meals. A St. Johns Check Stamped vessel broke and some of the resulting sherds were discarded on top of the sand and shell admixture. Shortly, the inhabitants began dumping oyster shells over this point to form the "loose oyster" shell layer shown on the profile. With these shells were mixed a few sherds, food bones, and other debris. The resultant surface of oyster shells may have been used as a living area. A deposit of coquina shells was made on the slope of the oyster shell midden toward Mosquito Lagoon. Next, a similar deposit of oyster shells was made on this same slope (fig. 2, between 4 and 5).

At this time the staple food of the inhabitants seems to have changed from oysters to coquinas and the middle zone of coquina shells began to accumulate. The lowest few inches of this middle zone became mixed with a large amount of ash and charcoal. In one place in this ash and charcoal deposit was a lens of red ochre, 7 inches across and 1 inch thick, mixed with coquina shells. Here, in the face of the midden, a cockle shell was found about one-third full of red ochre and coquina shells.

After the passing of a considerable amount of time, during which the "crushed coquina" zone accumulated, the principal food of those living at Castle Windy shifted again—this time to oysters and clams. Deposits of dirt plus these shells formed the highest zone in the tested area.

It is impossible to satisfactorily explain such radical changes in food shells with depth. A possible reason might be minor changes in the immediate environment. A storm, for example, may have opened or closed a pass between Mosquito Lagoon and the ocean, changing the salinity of the lagoon with a resultant effect upon its production of oysters. Coquinas, while probably never found in the lagoon, could be found most of the time on the beaches on the

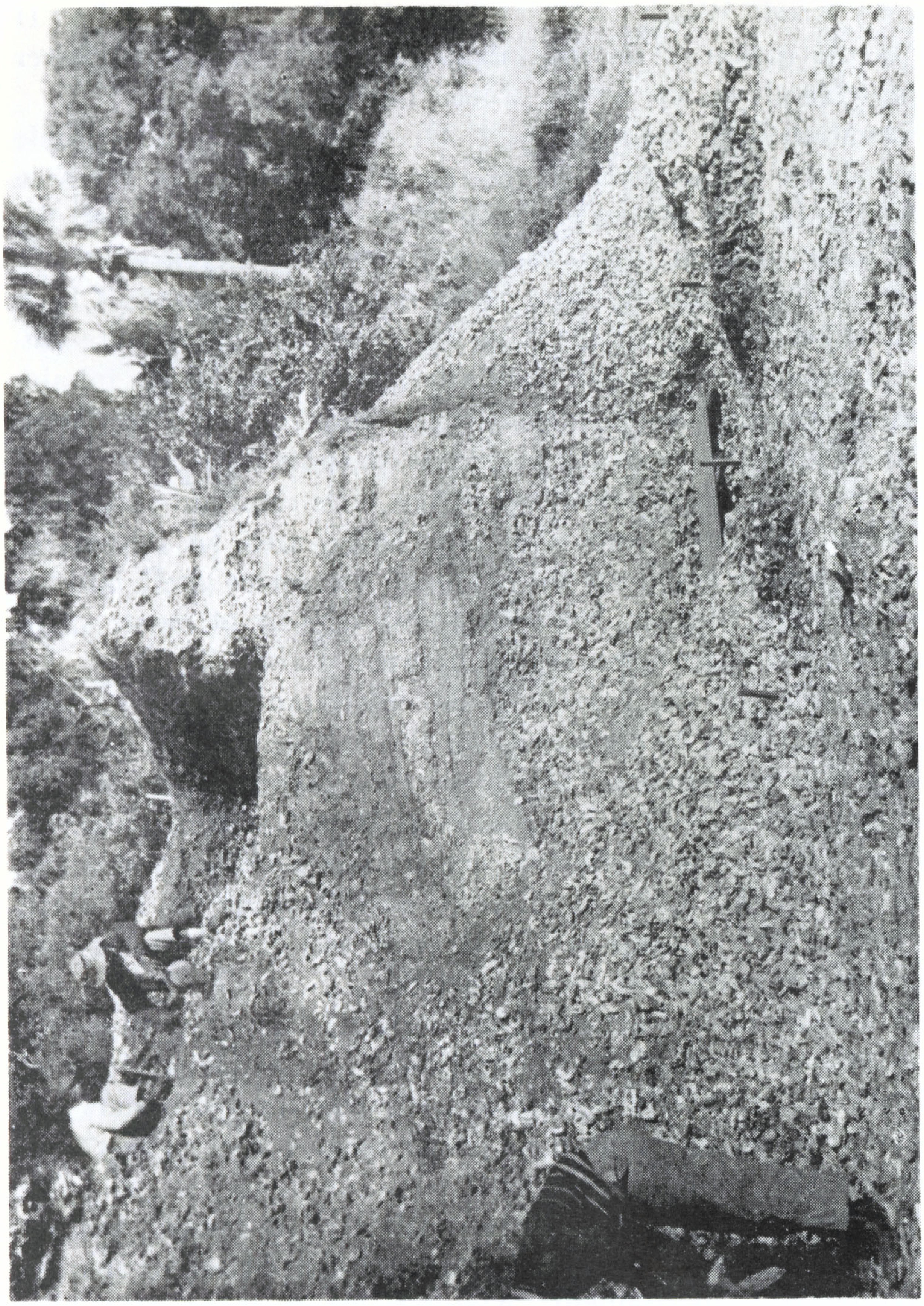

Plate III. The Initial Stage of Trenching

Atlantic side of the island only a short distance away. These beaches, or the ocean floor near them, were undoubtedly the source of the various marine univalves and bivalves found in the midden while the clams probably came from saline areas of the lagoon.

The above comments emphasize the main constituents of the midden—oyster, coquina, and clam shells. It should be borne in mind that many other types of shells were also found in the midden, although in smaller quantities. A discussion of them will be found under "FOOD REMAINS."

The midden started to accumulate at least 50 feet from the shore of Mosquito Lagoon. Growing in elevation, it also grew toward the lagoon until it, apparently, reached the water's edge. Undoubtedly, it also grew away from the lagoon, but our profile does not cover that portion of the site.

As suggested on the profile, various lenses of charcoal and ashes were encountered. One, at a depth of 18 inches in the west corner of our trench (fig. 2, northwest of *A1*), formed part of a small hearth. A black greasy deposit, 3 to 4 inches in thickness, covered most of Square A1—A2 at a depth of about 2 feet. It may have been the edge of a house floor. Otherwise, typical shell midden deposits were encountered.

The midden contained a rather large quantity of fish, turtle, bird, and a few deer bones (see FOOD REMAINS). Relative numbers of these are indicated in Table 1. Also mixed with the midden shells were many fragments of pottery and various shell and bone tools. The vertical distribution of these has been given in Table 1. These objects are described in the next section and further discussed in the concluding portions of this report.

Charcoal samples for radiocarbon dating were secured from three locations: first, the small hearth found at a depth of 18 inches; second, the lowest 2 to 3 inches of the middle or "crushed coquina" zone, between depths of 10 and 10.5 feet; third, from among the oyster shells of the lower zone between depths of 14 and 17 feet. Determinations of the dates of these samples were subsequently run at the Lamont Geological Observatory of Columbia University. The dates are 650, 930, and 910 years ago or A. D. 1307, 1027, and 1047 respectively. All have a plus or minus allowance of 100 years.

TABLE 1. RESULTS OF STRATIGRAPHIC TEST AT THE CASTLE WINDY SITE

Area of Test	Profile Zones	Depths in feet	St. Johns				Halifax				Other Artifacts		Food Bones						Limestone
			Plain	Ch. St.	Scored	Punctated	Plain	Scored	Simple Stamped	Check Stamped	Shell	Bone	Turtle	Fish	Shark	Bird	Deer	Crab Claws	
7 by 15 feet	Dirt and clams	0-1	78	218	5		4				5	2	69	248	2	115	12	1	4
		1-2	41	171	7						7		98	150	9	66[i]	6[j]		
		2-3	22	121	5	1		5			4		25	108	4	28	2[j]	2	2
		3-4	13	35	2		7	1[g]			2		67	67	3	6	3	1	
8 by 8 feet		4-5	5	20	1	1[b]	3	1[g]	1		1	1	61	103	10	3	3	1[k]	
	Coquina	5-6	28	57[a]	3		98	5	1	4			55	89	47	3	10[j]		1
		6-7	70	65	8	1	164	3	2	1	3	2	43	89	24	14	1	2	1[l]
4 by 7 feet		7-8	19	27	14		22	4		3	1		8	62	6	7	2		1[l]
		8-9	15	27			2				1	1	15	75	40	12	4[j]		
		9-10	18	6	2		1				1		10	25	2		7	1	
	Ash	10-10½	11	7	1		2					1	6	25	1	2	2		
	Loose oysters	10½-11	3	3										5					
		11-12		3	1								4	14	1				
		12-13	3	12	5	1[c]	2[e]						3	16	1	1			
		13-14	13	18	7		7[f]						10	25				2	1[l]
		14-15	14	17	1		1[f]						12	35	1			1	
		15-16	27	36	5	1[d]	2[f]				2		11	26[h]	9		1[j]	1	2[l]
		16-16½	3	8									5	7		6			

[a] Includes two with red-painted interiors

[b] Punctated over check stamping

[c] Semi-polished, not punctated

[d] Broad-line incised, design suggests Crooked River Complicated Stamped

[e] Belle Glade Plain-like

[f] Sand-tempered plain, not Halifax

[g] With comb-marked exterior surfaces

[h] Plus twenty Bottle Nosed Dolphin bones

[i] Includes two bones of the extinct Great Auk

[j] Plus one raccoon bone

[k] Plus two alligator bones

[l] Ochreous

These dates will be discussed later, but it seems desirable to mention here that the tested portion of the Castle Windy site seems to cover a period of 350 years. The specimens to be described are referable to that portion of the St. Johns II period which occurred between about A. D. 1000 and about A. D. 1350.

SPECIMENS

Pottery

Pottery from the Castle Windy site is limited to sherds of St. Johns (chalky) and Halifax (sandy) pastes. It is the second excavated Florida site to produce an appreciable quantity of Halifax Series ceramics. The vertical distribution of sherds is given in Table 1.

The vast majority of St. Johns Series sherds from Castle Windy are typical of the hard end of the range of St. Johns paste. They are "very hard and ring with a clear, sharp sound when tapped" (Goggin, 1952, p. 101). Only a few sherds, limited to the highest 2 feet of the midden, might be called "medium soft." No sherds were found of the "soft" variety of St. Johns paste.

St. Johns Check Stamped sherds from Castle Windy exhibit great variation and rather pronounced linearity in stamped impressions (pl. IV). In general, checks are large and appear to have been carelessly applied with old, well-worn paddles. There is a fair amount of overstamping. In some cases check stampings have been "smoothed over." In other cases, "scoring" has been applied over check stampings. Two check-stamped sherds with red-painted interiors should be noted. Only a few sherds bear small checks (pl. IV, *H*).

For comparative purposes the number of checks per inch was counted when possible. The resultant data have been plotted in Figure 3. In the case of "linear check-stamped" sherds, a ruler was held parallel with the linearity and the number of small lands counted. In some cases this may have produced slightly larger checks than the opposite measurement. However, we do not believe the results have been affected significantly.

Check stamping at the Castle Windy site is similar in respect to its large size and linearity to that on St. Johns Check Stamped

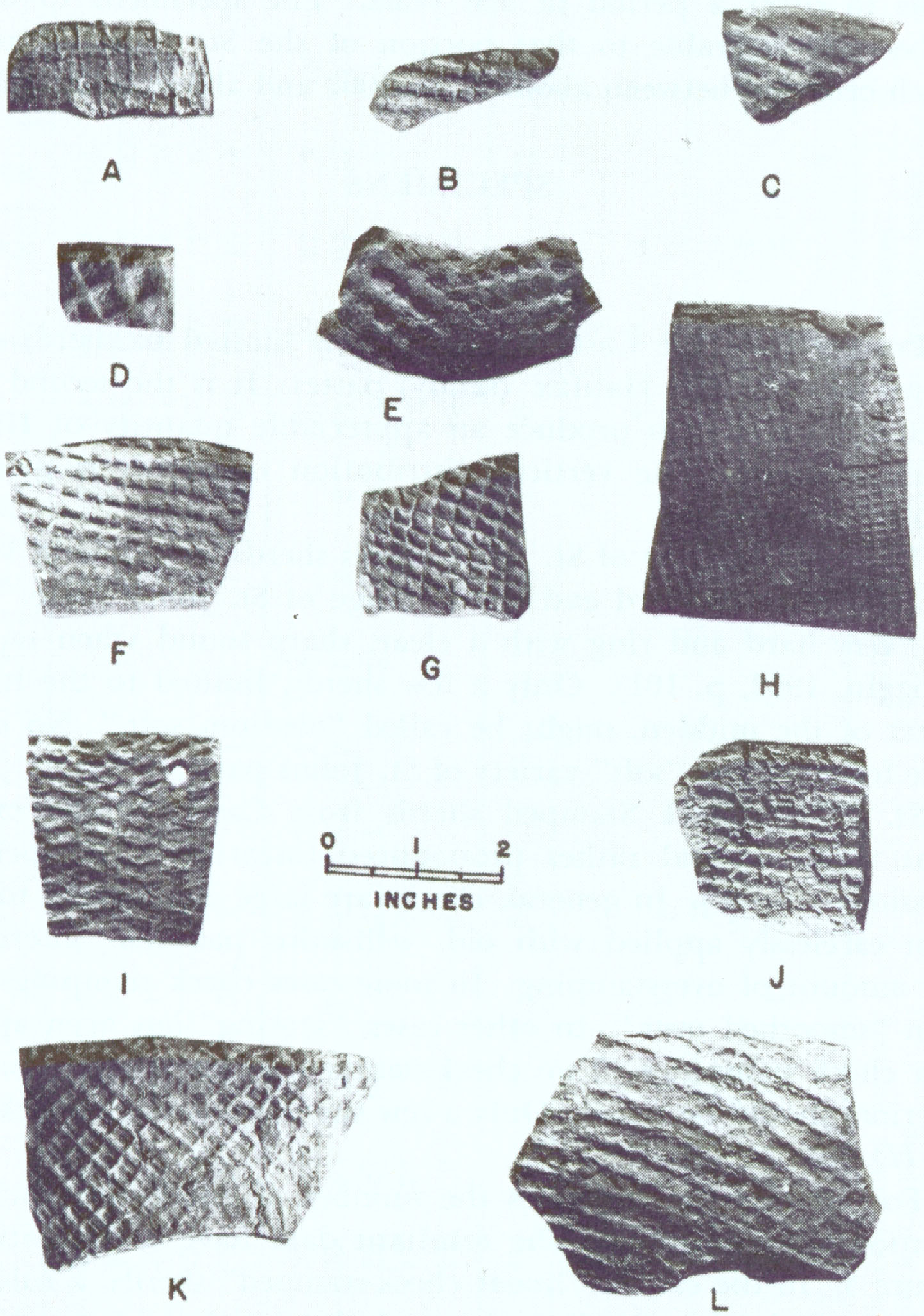
A
B
C
D
E
F
G
H
I
0 1 2
INCHES
J
K
L

Plate IV. Variations in St. Johns Check Stamped Sherds

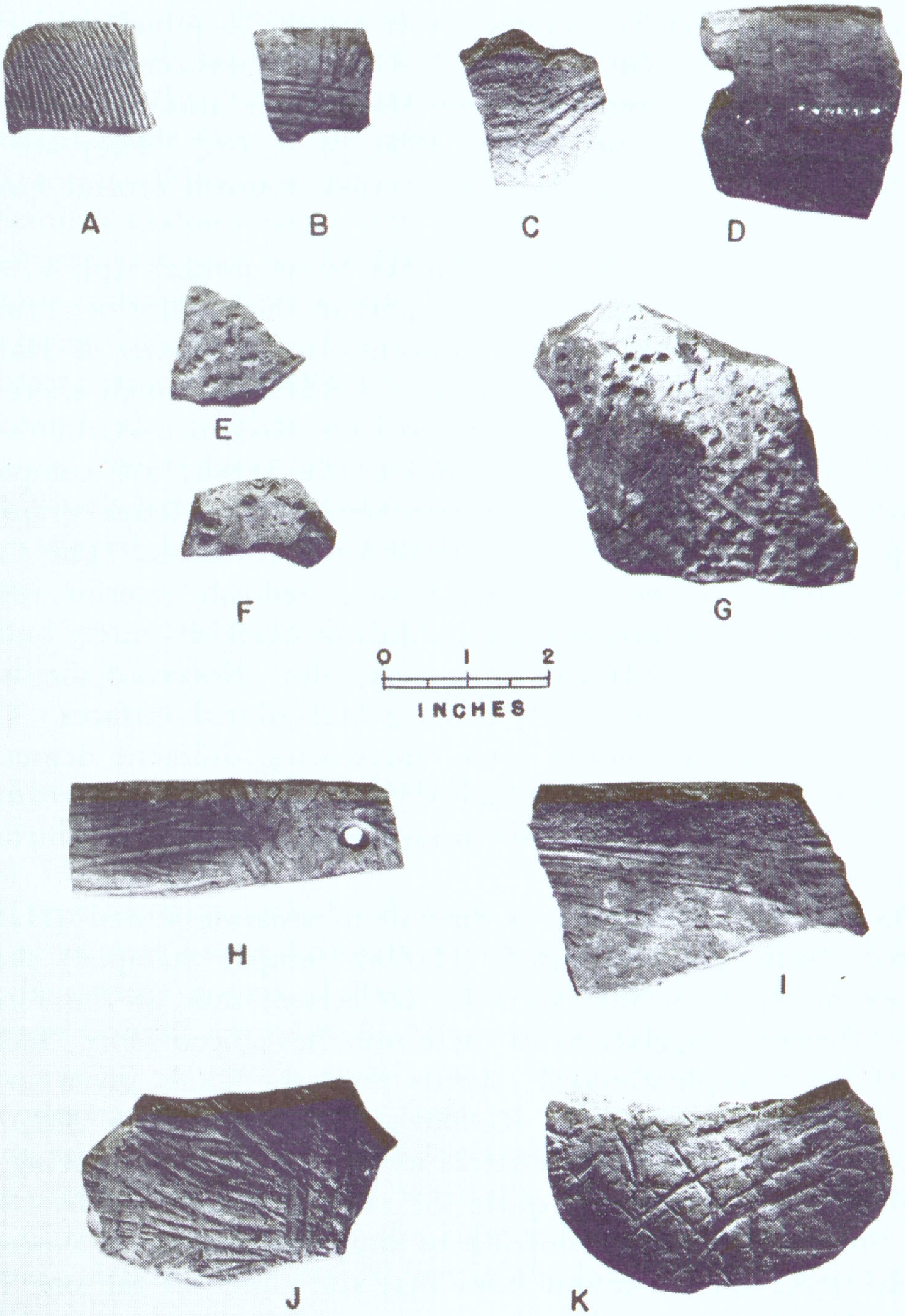

Plate V. Sherds of Halifax and of St. Johns Pastes
A, Halifax comb-marked; *B,* Halifax Simple Stamped; *C,* Halifax Scored; *D,* Halifax Plain; *E-F,* punctated, St. Johns paste; *G,* punctated on St. Johns Check Stamped; *H-J,* St. Johns Scored; *K,* portion of circular, flat base, St. Johns paste.

sherds found at the Safety Harbor site on Tampa Bay (Griffin and Bullen, 1950, p. 10, pl. 1, *EE*). Another similarity in pottery between these two sites may be pointed to in respect to punctated sherds. Those from Castle Windy (pl. V, *E - G*) are reminiscent of "random punctated" sherds from the Safety Harbor site although the paste is different (Griffin and Bullen, 1950, pl. I, *CC*). They are also similar to sherds of Lochloosa Punctated, a north central Florida pottery type (Bullen, 1953).

A rather high incidence of Halifax Series pottery (pl. V, *A-D*) is shown in Table 1 for the upper part of the middle or "crushed coquina" zone. This pottery conforms to definitions of Halifax types (Griffin and Smith, 1949, pp. 348-349) although there are minor differences when actual sherds from Nocoroco (Griffin's and Smith's type site; Figure 1, *6*) and Castle Windy are compared. Sherds from Castle Windy contain smaller and fewer grains of temper on the average than do those from Nocoroco. The Castle Windy sherds rather uniformly have a reddish interior surface color. Exterior surfaces may be reddish or blackish—rarely buff—in color. Cores are of blackish or greyish color. Nocoroco sherds, on the other hand, seem usually to have buff-colored surfaces. These differences are only minor ones representing different degrees of the same characteristics. The combed variation of surface treatment (pl. *V, A*) found on two sherds from Castle Windy, is not included in the Nocoroco collection.

In the Halifax Series it is difficult to separate scored (Halifax Scored) from simple-stamped (Halifax Simple Stamped) sherds. An examination of the Nocoroco collection, now at the Florida State Museum, suggests to us there may have been more "scored" and fewer "simple-stamped" sherds than the totals given in the report on that site suggests (Griffin and Smith, 1949, p. 352). Or, to put it another way, the criteria we used to separate scoring and simple stamping were not quite the same as those used by Griffin and Smith. Such a minimizing of simple stamping at Nocoroco would make the collection from that site closer to the one from Castle Windy than might otherwise seem the case.

One other comment regarding the Halifax Series may not be out of place here. Griffin and Smith (1949, p. 348) in defining Halifax Simple Stamped wrote, "Base: One base sherd with teat-like support (tetrapod?)." Examination of this sherd at the Florida

State Museum shows it to be of a different paste than the majority of Halifax Series sherds and also to bear a different site number than that of the Nocoroco site. A letter to Griffin confirmed the fact that, while included in the type description, this sherd came from a nearby site. This inclusion was unfortunate as it naturally made Goggin feel the Halifax Series had possible Deptford connotations (Goggin, 1952, p. 111, fn. 7). The sherd in question is undoubtedly a tetrapod of a Deptford Simple Stamped vessel and not part of the Halifax ceramic complex.

Our collection from Castle Windy contains several examples of flat bases (pl, V, K). They were found in both St. Johns and Halifax pastes. Typically, they were about 8 inches across, slightly concave in the middle, and heavily scraped. Some St. Johns Check Stamped vessels had check-stamped bases but more often bases of such vessels were scored. Many of these containers appear to have been shaped like shallow bowls. One base exhibits three repair holes.

Shell Artifacts

The number of shell artifacts found in our excavations are listed in Table 1 by arbitrary levels. Typical examples are illustrated in Plate VI.

These artifacts include 11 *Busycon perversum* hammers *(Busycon perversum* Linne, formerly *B. carica eliceans* Montfort), 4 *Busycon perversum* gouges, 2 *Busycon contrarium* cups *(Busycon contrarium* Conrad, formerly *B. perversum* Linne), 2 detached columellas and 1 columella chisel made from *Pleuroploca* (formerly *Fasciolaria) gigantea* Kiener shells, 4 *Oliva savana* Ravenel shell beads, and 2 perforated *Noetia ponderosa* Say shells. These artifacts were irregularly distributed vertically throughout the highest 10 feet of our test except for the columella chisel which was found between depths of 15 and 16 feet in the lower zone of loose oyster shells.

Although their provience within the midden is not known, several other specimens discovered in the slump material prior to our excavations should be mentioned. A perfect example of a *Busycon contrarium* shell dipper or cup was found with considerable

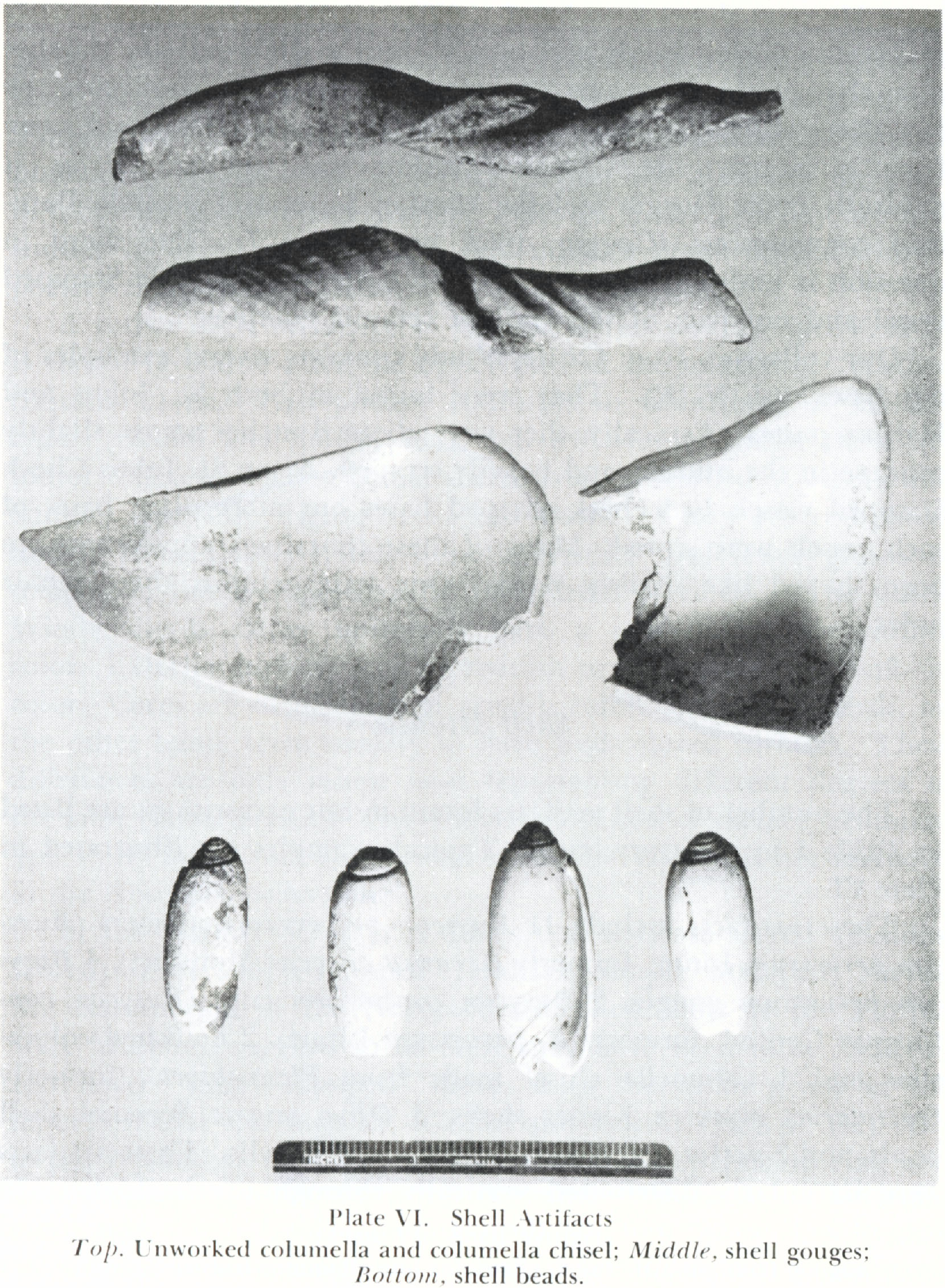

Plate VI. Shell Artifacts
Top. Unworked columella and columella chisel; *Middle,* shell gouges; *Bottom,* shell beads.

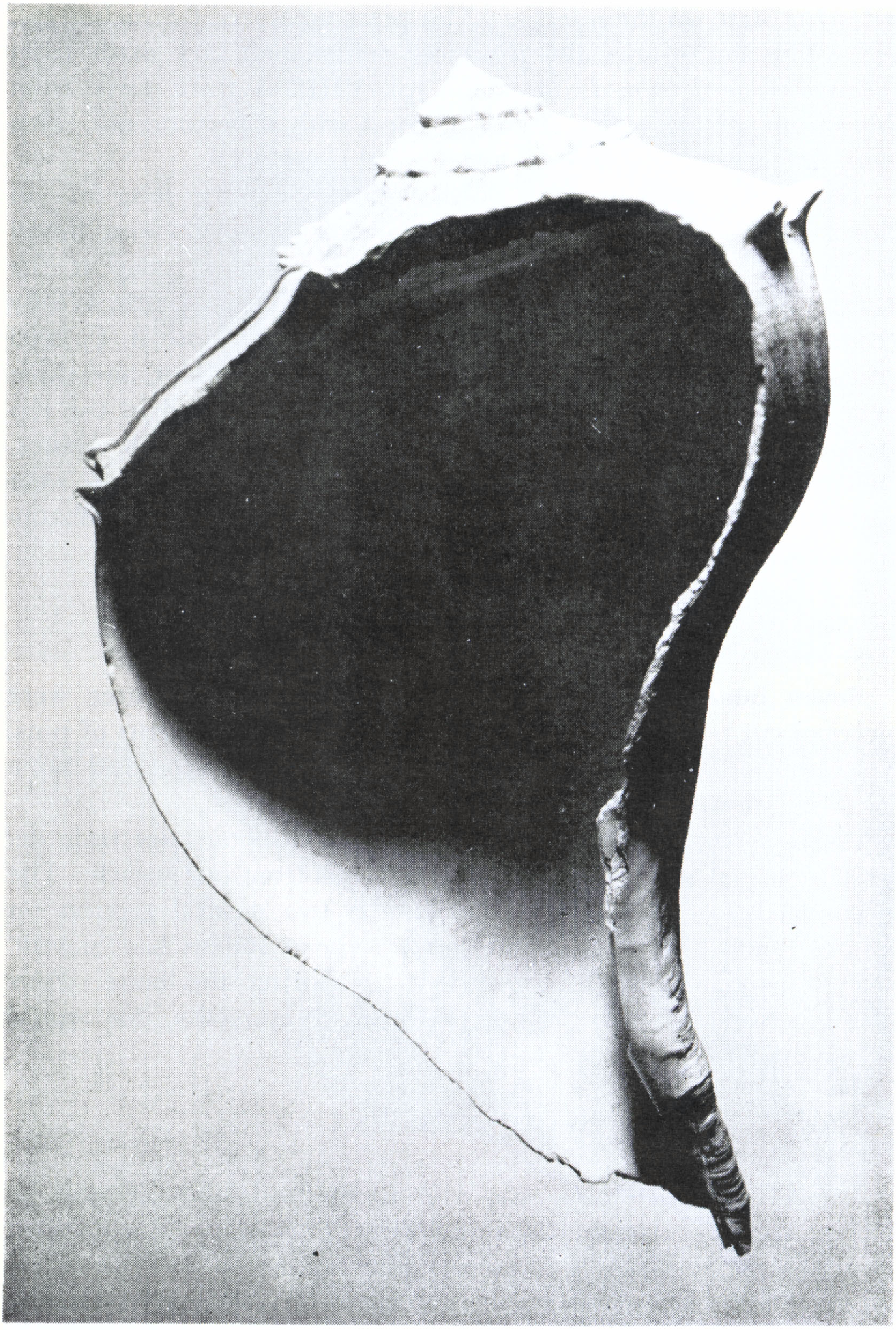

Plate VII. Shell Dipper or Cup

red ochre stain on the interior. This piece measured 9.5 inches (pl. VII). The slump area also produced a fine shell pick made from a *Busycon perversum* Linne shell (pl. VIII). A third piece from this slump section was a chunk of coral with a perforation. This piece may have been used as a net weight (pl. IX).

It is interesting to note documentation for the long life in Florida of some shell tools. *Busycon contrarium* gouges were found in pre-fiber-tempered (pre-Orange period) pottery zones at the Bluffton site (fig. 1, 7) about 45 miles northwest of Castle Windy (Bullen, 1955, p. 4) and must date there to well before B. C. 2000 (Bullen, 1956). At Castle Windy, one was in the top foot, and three were between depths of 6 and 10 feet. The one found in the top foot of the midden must have been made around A. D. 1350. Hence, the span of time during which *Busycon contrarium* gouges were made and used in Florida would be at least 3,500 years—probably much more.

Bone Artifacts

Seven bone artifacts are indicated in Table 1. Three were pieces of cut bone, 1 a fragment of an awl, and 3 fragments of pins. None was sufficiently complete to be classified by type and none exhibited any trace of decoration.

An interesting example of the processing of bone came from deposits removed in cleaning the face and not from our trench. The specimen, a cannon bone of a deer, has two natural grooves on opposite sides. Between these two grooves, an Indian has "sawed" two additional grooves preparatory to spliting the bone. Four long pieces of bone may thus be procured. Presumedly, they would be made into pins or awls.

FOOD REMAINS

Considerable attention was paid to the collection of food remains within the Castle Windy midden. This included a detailed examination of the shell content of the midden as well as of the bones of fish, mammals and birds. Because of their perishable nature, no remains of vegetable foods were apparent; however, it is taken for granted on the basis of the time horizons involved that

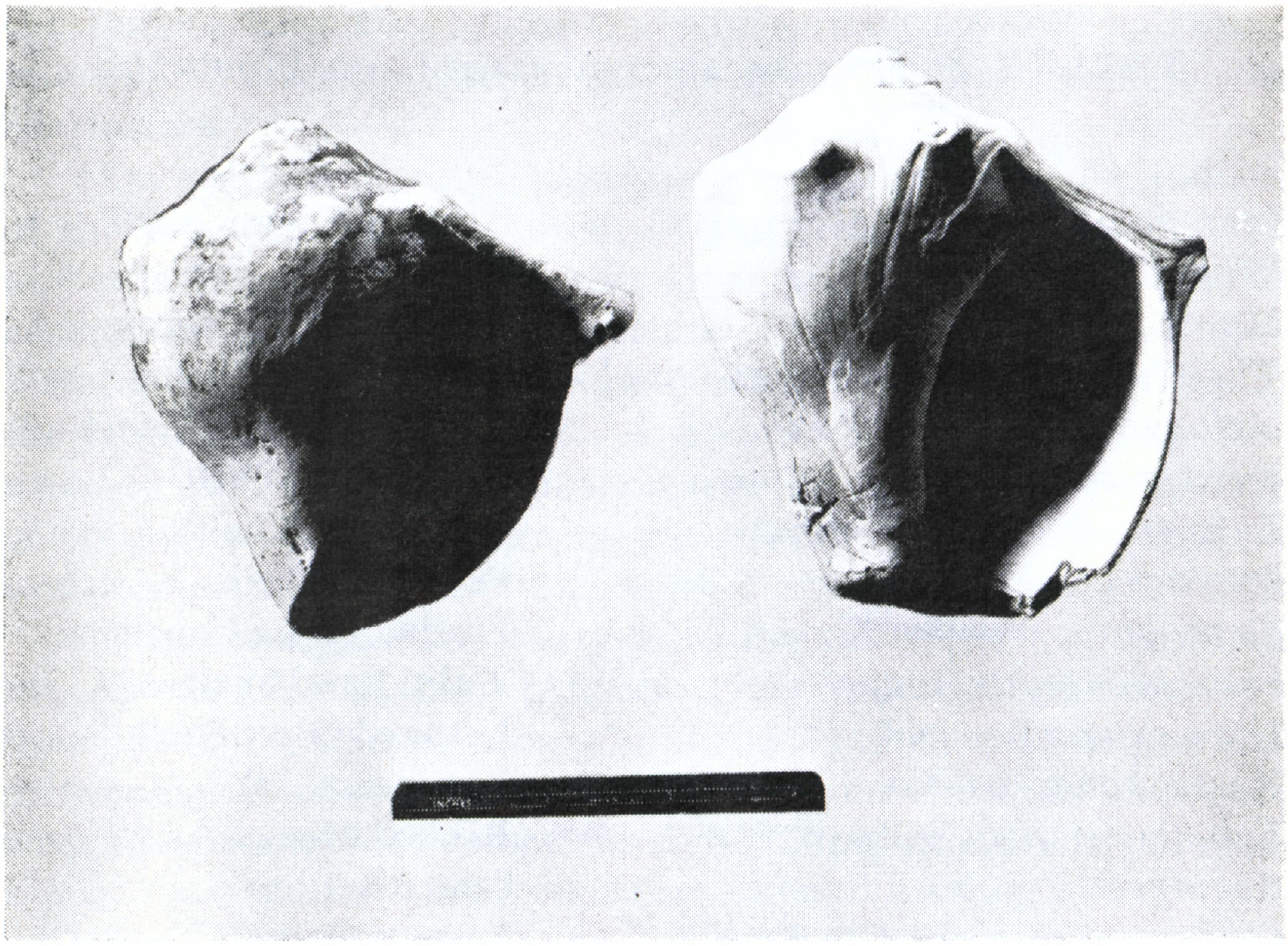

Plate VIII. Shell Pick (left) and Shell Hammer (right)

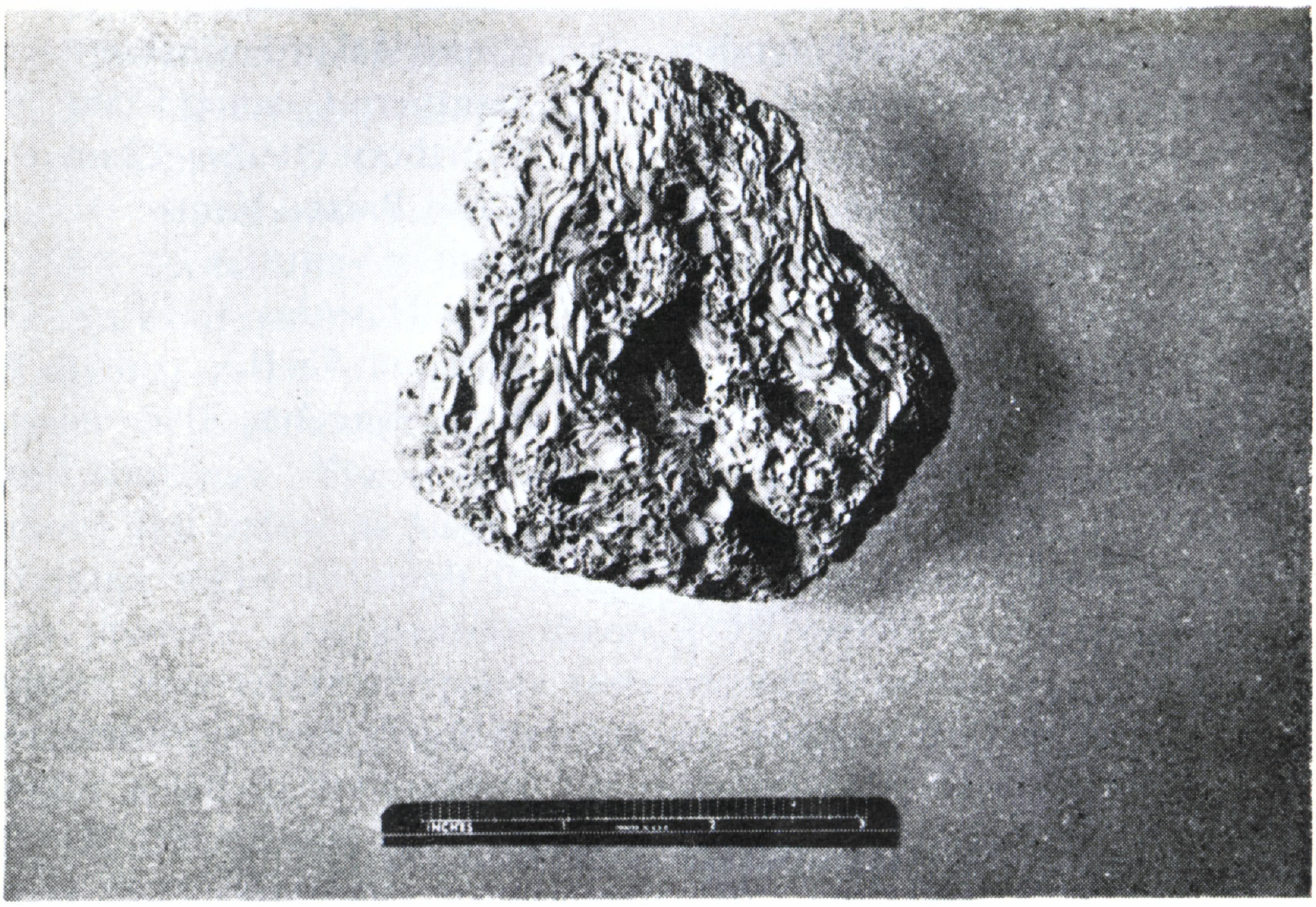

Plate IX. Perforated Coral Net Weight (?)

TABLE 2. Shell species observed at the Castle Windy Site

Crepidula fornicata Say	Atlantic Slipper Shell
Polinices duplicata Say	Shark Eye
Murex fulvescens Sowerby	Giant Eastern Murex
Thais haemastoma floridana Conrad	Florida Rock Shell
Melongena corona Gmelin	Common Crown Conch
Busycon canaliculatum Linne	Channeled Whelk
Busycon contrarium Conrad	Lightning Whelk
Busycon perversum Linne	Perverse Whelk
Pleuroploca gigantea Kiener	Florida Horse Conch
Fasciolaria tulipa Linne	Tulip Band Shell
Oliva sayana Ravenel	Lettered Olive Shell
Noetia ponderosa Say	Ponderous Ark
Volsella demissus Dillwyn	Ribbed Mussel
Aequipecten gibbus Linne	Calico Scallop
Crassostrea virginica Gmelin	Eastern Oyster
Trachycardium egmontianum Shuttleworth	Prickly Cockle
Dinocardium robustum Solander	Giant Atlantic Cockle
Mercenaria campechiensis Gmelin	Southern Quahog Clam
Mercenaria mercenaria Linne	Northern Quahog Clam
Chione cancellata Linne	Cross-Barred Venus
Macrocallista nimbosa Solander	Sunray Venus
Dosinia discus Reeve	Disk Dosinia
Donax variabilis Say	Coquina Shell
Tagelus gibbus Spengler	Stout Tagelus

the Indians here also followed a semi-agricultural and gathering economy. Further attention will be given to this aspect in the conclusions.

That shellfish were of paramount importance to the Indians of this region is amply manifest by the great bulk of the midden at Castle Windy and related sites along the Florida east coast. As excavations progressed within the site, rather special and unique attention was paid to observations of shell species according to the arbitrary levels uncovered. A separate collection of shells was made at each level giving an indication of species and percentage of occurrence. That portion of the midden examined by this excavation revealed a total of 24 species of marine mollusk (Table 2).

Shell or mollusk identifications within this report are based on the Abbott Classification (Abbott, 1954) which differs somewhat from the Smith Classification (Smith, 1937) often used in previous archaëological reports from Florida. It is our desire to keep pace with advances in Malacology through the use of current classifications.

When considered on a percentage basis, however, it was apparent that several species predominated, thus:

60% *Crassostrea virginica* Gmelin (Eastern Oyster)
30% *Donax variabilis* Say (Coquina)
5% *Mercenaria campechiensis* Gmelin (Southern Quahog Clam)
Mercenaria mercenaria Linne (Northern Quahog Clam)
5% Remaining 20 miscellaneous species

An examination of the profile of our excavation (fig. 2) reveals 3 distinct zones. The lower zone is predominantly composed of oyster shells although 15 other species were present including clams and coquinas. The middle zone stands in contrast to both that above and below in having a nearly 100 per cent accumulation of coquina shells although it should be noted that 13 other species are present. The greatest diversity of species was found in the upper zone where 18 species were recorded; however, oysters again predominate with clams forming the greatest bulk of that genera so far noted in the midden.

Of the miscellaneous species mentioned above, the following were most commonly encountered (but less than 5% of the total midden accumulation):

Polinices duplicata Say (Shark Eye)
Murex fulvescens Sowerby (Giant Eastern Murex)
Busycon contrarium Conrad (Lightning Whelk)
Fasciolaria tulipa Linne (Tulip Band Shell)
Noetia ponderosa Say (Ponderous Ark)
Dinocardium robustum Solander (Giant Atlantic Cockle)
Tagelus gibbus Spengler (Stout Tagelus)

It is safe to conclude that the remaining species were of little or no importance as food items and constitute either accidental inclusion in shellfish gathering by the Indians or were collected for eventual use as tool, utensil, or ornament materials.

The quantity of turtle, fish, shark, bird and deer bones as well as crab remains from the work at this site is indicated in Table 1. Fish bones were in abundance and indicate tremendous use by the Indians of marine species such as Mullet (*Mugil cephalus*), Snook (*Centropomus undecimalis*), Redfish or Channel Bass (*Sciaenops ocellatus*), and shark. Although not a fish, we discovered in the 15 - 16 foot level most of the skeleton of a Bottle Nosed Dolphin (*Tunsiops truncatus* Montague). We are indebted to Dr. Walter A. Auffenburg, Department of Biology, University of Florida, for this identification.

Bones from 9 species of birds were recovered from the Castle Windy excavations. As Table 1 indicates, the great majority of these were retrieved from the upper 2 zones. Nevertheless, bird remains were found in the lowest level and all species apparently persisted throughout the midden's time span. Determinations were graciously made by Dr. Pierce Brodkorb and Miss Penelope H. Weigel, Department of Biology, University of Florida, and are as follows:

Myctreia americana (Wood Ibis)
Pelecanus occidentalis (Brown Pelican)
Morus bassanus (Gannet)
Phalacrocorax auritus (Double-crested Cormorant)
Ardea herodias (Great Blue Heron)
Aythya sp. (Diving Duck)
Cathartes aura (Turkey Vulture)
Haliaeetus leucocephalus (Bald Eagle)
Larus argentatus (Herring Gull)
Pinguinus impennis (Great Auk)—EXTINCT SPECIES

The finding of Great Auk bones (2 humeri) at Castle Windy is noteworthy. The Great Auk became extinct during the mid 1800's. As the bird lacked the ability to fly and as its normal range was a northern oceanic environment, it is of particular interest that its remains are encountered in an aboriginal Indian site in Florida. This is the second occurrence in Florida of the extinct Auk. The first find was made in the Cotton Site (fig. 1), a shell midden near Ormond (Batchley, 1902) and consisted of two left humeri. These bones were found in a relatively deep level belonging to the Orange Period (Griffin and Smith, 1954, pp. 52-53). By contrast, the Auk remains from Castle Windy came from the 1-2 foot level, dating approximately A. D. 1307. The radiocarbon determination from the Orange Period of the Cotton Site is given as B. C. 1060 (Bullen, ms.). It is hoped that further evidence of this species will be found to solve the present enigma.

The most common mammal bones from this site are those of a sub-species of the Virginia white-tailed deer (*Odocoileus virginianus osceola*). Also frequent are bones of racoons, opposum, and rabbits. From the 13-14 foot level was uncovered the calcaneum of a wildcat, *Lynx rufus*. This determination was made by Dr. James N. Layne, Department of Biology, University of Florida.

CHRONOLOGICAL DISCUSSION

Castle Windy is the first coastal midden in Florida for which we have a series of radiocarbon dates. These dates are A. D. 1307 for a charcoal deposit situated 1.5 feet below the top of the midden, A. D. 1027 for charcoal from the base of the middle or "crushed coquina" zone between depths of 10 and 10.5 feet, and A. D. 1047 for charcoal collected from among loose oyster shells of the lower zone between depths of 14 and 17 feet (fig. 2). All of these dates have a plus or minus allowance of 100 years.

These dates indicate that the loose oyster shells of the lowest zone accumulated very rapidly (there being no essential difference between the dates for depths of 10-10.5 and 14-17 feet), that the site was first occupied somewhat earlier than A. D. 1027—probably about A. D. 1000, and that the site was abandoned after A. D. 1300—probably about A. D. 1350. The Castle Windy site was occupied, therefore, over a period of about 350 years.

Obviously, there are, in general, two ways to handle the Castle Windy radiocarbon dates. If one subtracts the allowance in years from the latest date and adds the allowance to the earlier (averaged) date, the result would be A.D. 1207 and A.D. 1137. This would "compress" the history of the site into 70 years. Reversing the process would expand the life of the site to about 450 years. We prefer the interpretation given in the previous paragraphs.

Examination of Table 1 reveals that St. Johns Check Stamped pottery was the dominant pottery type from the top to the bottom of the Castle Windy midden. Between depths of approximately 3 and 8 feet, sherds of the Halifax Series, principally undecorated, were found intermixed with those of the St. Johns Series.

By definition, all of these deposits are assignable to the St. Johns II period of the northern St. Johns region (Goggin, 1952, p. 53). Lack of any historic items or of any evidence of influences from the Ft. Walton-Safety Harbor periods of the Florida Gulf coast or from late cultures of coastal Georgia suggest the Castle Windy site is limited to the St. Johns II A subperiod. However, the terminal date of A. D. 1350, as given above, may prove to be within the St. Johns II b subperiod.

In his 1952 presentation of sequential chronology in the northern St. Johns area, Goggin (1952, p. 36) suggested A.D. 1125 for the start and A.D. 1425 for the close of the St. Johns II A period. Radiocarbon dates from the Castle Windy site agree well with these estimates but indicate the beginning (and possibly also the ending) of the St. Johns II period should be earlier than previously thought. We feel that the introduction of St. Johns Check Stamped pottery, marking the change from St. Johns I to St. Johns II times, must have occurred at least as early as A. D. 1000.

As has been pointed out earlier, the Halifax Series sherds from Castle Windy closely parallel those found by Griffin and Smith at the Nocoroco site about 40 miles to the northwest (fig. I, *6*). This parallelism is duplicated in the St. Johns Series sherds as well as those of the Halifax Series. This similarity is so great that the Nocoroco site may be assumed to equate temporally with the upper part of our "compact crushed coquina" zone where, between depths of 5 and 7 feet, Halifax sherds were found in large quantities.

Griffin and Smith (1949) presented a strong argument that the site they excavated was the historic Timucua village of Nocoroco shown on Mexia's map of 1605 (Rouse, 1951, p. 266). Their identification, however, was based on three major points: first, Mexia's map; second, a fragmentary pair of rusted iron scissors found, 6 inches deeper than other historic items, between depths of 12 and 16 inches; third, the similarity in paste (and to a lesser extent decoration) between Halifax sherds and those of the San Marcos Series. San Marcos pottery is well documented as belonging to the Spanish Mission period of northeastern Florida, circa A. D. 1565-1725.

The location shown on Mexia's map is not specific and other locations than the excavated one might more likely be considered the correct site for the historic town of Nocoroco (Griffin and Smith, 1949, p. 341).

As there was an extensive British Period (A.D. 1763-1783) occupation of the site (Griffin and Smith, 1949, p. 356), the scissors may belong to that period. Obviously, the pottery argument is the most important one.

When Griffin and Smith studied the pottery they excavated, no stratigraphic information was available relative to sand- or grit-tempered pottery in the St. Johns area except that for San Marcos ceramics. The Halifax sherds from Nocoroco (and also those of the St. Johns Series) are nearly identical to those from Castle Windy while both groups differ from those of the San Marcos Series both in paste and in surface treatment. Griffin and Smith (1949, p. 354) noted the differences from San Marcos pottery but had no other collections with which to compare their specimens. We feel the site at Nocoroco should be re-evaluated.

The peak in the vertical distribution curve for Halifax Series sherds at Castle Windy is very sharp (Table 1) and occurs about midway between deposits dated by radiocarbon methods. Evidently, this pottery was made between A. D. 1050 and A. D. 1350, probably around A. D. 1200. It is evident, hence, that the site at Nocoroco, where duplicate pottery was found, was undoubtedly occupied at the same time, around A. D. 1200.

This Halifax ware must represent influences, and probably people, coming from outside the area. The similarity in paste between sherds of the Halifax Series and those of the Alachua Series suggests that Halifax ceramics may represent an eastward extension of influences from Georgia which, at about this time, were establishing the Alachua Tradition in north central Florida (Goggin, 1949, pp. 19, 39-40; Bullen and Griffin, 1952, p. 61). The three Lochloosa Punctated-like sherds support this hypothesis as such sherds are part of the Alachua Tradition (Goggin, 1949, p. 39: Bullen, 1953, p. 64).

Such influences seem to have had little permanent effect in the New Smyrna region, probably because it was not an especially good farming region as was north central Florida.

Griffin (1948b, p. 53), in an article concerning chronology in Volusia County, presented a graph of the number of checks per inch on St. Johns Check Stamped sherds from three superimposed levels at Green Mound (fig. 1, *4*). In Figure 3, we present a similar graph for our arbitrary excavation levels.

Our curves show a peak at four checks per inch almost uniformly from the base to the top of the Castle Windy midden. The range in number of checks per inch is narrow, except for the highest three and some of the lowest levels where there is an indication of the use of smaller checks on some sherds.

The Castle Windy curves might be said to agree with Griffin's curve for his Period 4 or the last phase of occupation at Green Mound. He mentions for the top portion of that mound the appearance, apparently absent at greater depths, of scoring (Griffin,

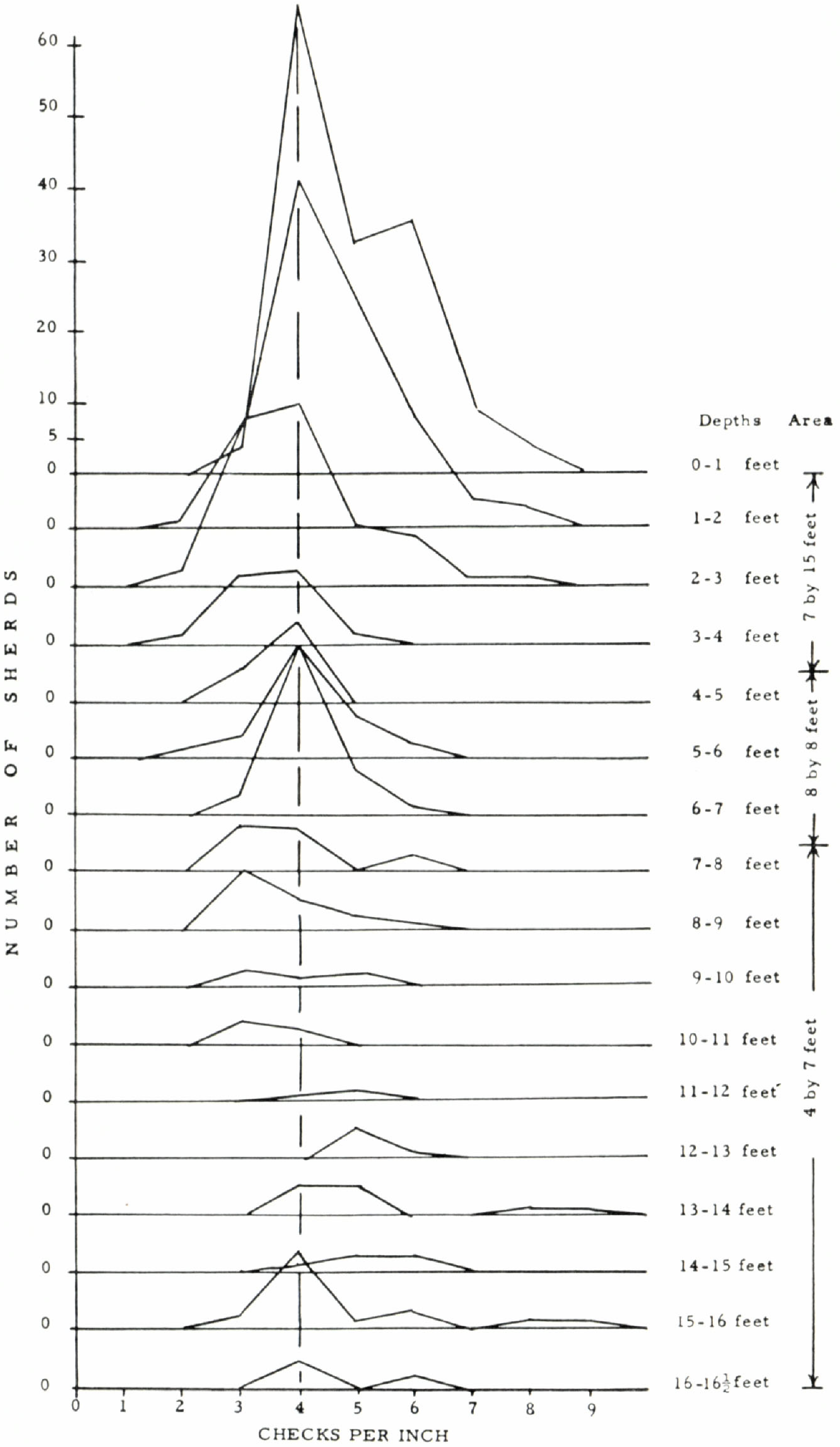

Fig. 3. Number of checks per inch on St. Johns Check Stamped sherds from different stratigraphic levels at the Castle Windy site.

1948b, p. 50). This scoring and the size of the checks would support the idea that all of the Castle Windy site might be equated with the highest zone at Green Mound. Such a correlation is possible but, in view of the radiocarbon dates from Castle Windy, it is hard to believe. It would imply that the division between St. Johns I and II occurred very much earlier than is believed at present. It seems more likely that the size of checks on St. Johns Check Stamped vessels is not a reliable index of age.

INTERPRETATIONS BASED ON FOOD REMAINS

When formulating conclusions concerning the Castle Windy site, one is interested in the time span of the cultural material. Correlation of the artifact remains with those from other sites and regions is paramount. Then, too, one should ask what interpretations may be made with regard to the fundamental social and economic life of the people who constructed the midden. These are often elusive features with no tangible criteria.

Through a close examination of the food remains at Castle Windy, it is our opinion that valid interpretations may be made which cast light on a custom of the Florida Indians of the upper east coast and St. Johns River area. We refer to the historically reported custom of planting agricultural plots at certain seasons and of leaving the villages for several months to live elsewhere by means of a hunting-gathering type economy. Several contributors to the literature of Florida prehistory have called attention to this habit, but it is a feature which has not been demonstrated archaeologically.

Laudonniere, Commander of the French Colony in Florida in 1564, in reporting on subsistence habits of the Florida Indians, wrote (Swanton, 1922, p. 359):

> "They sow no more but that which they think will serve their turn for six months, and that very scarcely. For, during the winter, they retire themselves for three or four months in the year, into the woods, where they make little cottages of palm boughs for their retreat, and live there of maste, of fish which they take, of disters [oysters], of stags, of turkey cocks, and other beasts which they take."

Further in the same reference, Swanton quotes LeMoyne, French artist with Laudonniere, on the same topic:

> "After planting they leave the fields alone, as the winter in that country, situated between the west and the north, is pretty cold for about three months, being from the 24th of December to the 15th of March; and during that time, as they go naked, they shelter themselves in the woods. When the winter is over, they return . . ."

Can the food remains confirm a theory of seasonal occupation for the Castle Windy site, and if so, does it conform with the "three or four months" and "winter" period mentioned above?

Examining first the deer remains, it becomes apparent that all the bones discovered were from adult animals. Also, despite the large quantity of bone samples, there are no antler remains. It is interesting to note Strode's (1954) findings that the main rutting season for deer in this region is during the months of September, October, and November. The gestation period in turn approximates seven months. This means that fawning would come within the period of April, May, June and July. Antlers are shed yearly and are dropped during February and March. Thus, we may postulate that the Castle Windy Indians were hunting deer during the late winter months (after antlers are shed but before new born deer were large enough to be worthwhile prey), January through March.

Retaining these thoughts, we will turn to a consideration of the bird bones to test the seasonal aspect. On the basis of those species living in historic times, it is immediately of interest to note that four of the identified species (gannet, diving duck, bald eagle, and herring gull) are present in this region *only during the winter months*. The remaining four species (no consideration being given to the Auk remains) are birds native to the area on an annual basis. None of the birds represents species present only during the summer months. Also, all bones encountered indicated full maturity, a feature indicative of the winter months aspect. Thus, it would appear that the Castle Windy Indians were hunting birds as well as deer during winter months only.

Turning to the fish remains, we note a profusion of mullet, snook and shark bones. Commenting on this aspect, Dr. John D. Kilby, of the Department of Biology, University of Florida, voiced his opinion that the only fish that primitive people of the New Smyrna area would find "interesting" would be mullet and snook. Dr. Kilby reports that mullet used to frequent the area in astronomical numbers. They would appear during cool weather or approximately November 1st to April 1st. Apparently sharks follow the other fish irrespective of the time of the year. Again, we have an indication of winter fishing habits associated with winter hunting.

As was mentioned earlier, oysters, clams, and coquinas formed the bulk of the shellfish diet for the Castle Windy population. In historic and recent times the people of the New Smyrna region have had some rule of thumb concepts concerning the eating of shellfish—oysters and clams. Such contemporary observations might well present clues to aboriginal collecting habits. Repeated inquiries among individuals closely associated with commercial fishing and allied interests disclose a contemporary trend to collect and eat oysters only during the colder months. This is generally a period extending from September through April. There appear to be two basic reasons for not collecting and eating oysters during the warmer spring and summer months: first, the oysters are not palatable; second, a reduction in size of the mollusk itself makes the collecting of the oyster unrewarding. Returning to the palatability aspect, it is worth noting that certain mollusks—oysters in particular—become toxic during the summer months through the habit of feeding on dinoflagellates such as *Gonyaulax* (personal letter, February 4, 1958, from Dr. V. L. Loosanoff, Fish and Wildlife Service, Bureau of Commercial Fisheries, Milford, Connecticut). The eating of such shellfish during the summer months can result, therefore, in paralysis and much discomfort.

Clams apparently do not become as toxic as oysters during the summer months, but it will be remembered that clams formed but a very small percentage of the shell diet at Castle Windy. Considering this two-fold evidence, and the predominance of oyster shells, it is within the realm of possibility, therefore, that the Indians at this site maintained seasonal collecting habits with regard to shellfish collecting and may have restricted these activities—as with hunting and fishing—to the colder, winter months.

A winter gathering of coquina seems to have been prevalent here also. Although this mollusk may be eaten at any time, they appear to be larger in the winter months. This was the case with the specimens examined at Castle Windy. Dr. R. Tucker Abbott, Department of Mollusks, The Academy of Natural Science of Philadelphia, made an interesting comment concerning the middle zone of the Castle Windy site, that the ". . . middle band of Donax would seem to indicate that a major storm had upset the ecology of the immediate area to produce good Donax beaches, and possibly the smothering of the local oyster beds." (personal letter, January 3, 1958, from Dr. Abbott). A sidelight of interest in this connection is the sudden increase in shark bones within this zone as outlined in Table 1.

In conclusion, therefore, it may be demonstrated on the basis of the determinations listed above that the Indians of Castle Windy occupied the site on a limited seasonal basis, during the cold or winter months of each year. The period may have extended from November through March. During the remaining months of the year, these Indians undoubtedly moved inland to their agricultural plots.

As there was no evidence of marked change in subsistence habits between the lower and upper levels of this midden, it may be assumed that this pattern of economy continued in vogue—according to radiocarbon dating—from approximately A. D. 1000 to approximately A. D. 1350.

This seasonal shift in economy has long been known through historical sources. The findings at Castle Windy permit an archaeological demonstration of the fact. Also, it now becomes evident that this habit not only persisted during the historic contact period but was followed for several hundred years prior to that time. Close observations in other sites might reveal an even earlier extension of the practice.

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